

INFORMATION SHEET

ORDER NO.

STATE OF CALIFORNIA, DEPARTMENT OF PARKS AND RECREATION
CALAVERAS BIG TREES STATE PARK
WASTEWATER TREATMENT FACILITY
CALAVERAS COUNTY

Facilities and Discharge

The State of California Department of Parks and Recreation owns, operates, maintains, and monitors eight separate wastewater treatment and disposal systems within Calaveras Big Trees State Park. The wastewater systems include collection, treatment, storage, and disposal facilities.

The largest of the eight wastewater treatment and disposal systems is the North Grove WWTF which serves facilities within the North Grove Campground area, including the five restrooms within the campground; two restrooms within the day use areas; and restrooms at the visitor center, ranger office, park kiosk, Jack Knight Hall, and RV/trailer dump station. The Discharger assumed that approximately 300 campers and 500-day use visitor would use the North Grove facilities on a daily basis, and that approximately 7,000 gallons per day (gpd; maximum basis) of wastewater will be generated.

The North Grove WWTF consists of a collection system, 20,000 gallon septic tank, effluent conveyance system, leachfields (existing and new), and sprayfield. The existing leachfield is within a cut on a steep hillside approximately 450 feet west of the septic tank and has approximately 400 lineal feet of six inch diameter perforated piping. Because of performance issues with the existing leachfield system, the Discharger proposes to construct and utilize a new leachfield. The new leachfield disposal area will consist of approximately 1,330 lineal feet of leachline located in an area encompassing approximately 35,000 square feet. The Discharger has calculated that the amount of leachlines to be installed can dispose of approximately 19,900 gpd, which is three times more than the projected flows from the North Grove facilities.

Historically, the Discharger has utilized a spray disposal field in the summer months to dispose of undisinfected wastewater. The sprayfield is on a fairly steep hillside, is approximately one half acre in size, and has eight irrigation riser pipes. The irrigation heads on the riser pipes are bubbler type heads. The Discharger's RWD indicates that the Discharger was not going to disinfect wastewater prior to discharge to the spray disposal fields, but was planning on installing a tailwater collection ditch or detention berm along the downhill side of the spray irrigation field to capture any tailwater runoff and stormwater runoff from the spray disposal fields. Because of staff's concerns about the practicality of containing all storm water runoff (including snowmelt) from the sprayfield, the Discharger indicated that improvements (i.e., tailwater/stormwater control or disinfection) will not be made at this time due to funding issues and therefore the sprayfield will be valved off and taken out of service. The Discharger states that if funding does become available, the sprayfield may be modified and brought back into service. The Discharger needs to continue to use the sprayfield until the new leachfield is constructed in 2006. However, this Order only allows the use of the sprayfield beyond 1 October 2006 if the Discharger submits, and the Executive Officer approves, a report certifying that a wastewater disinfection system has been constructed, is capable of meeting effluent limits prescribed by this Order, and is fully operational.

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The other seven wastewater treatment and disposal systems throughout the park are septic tank/leachfield systems. The systems serve seasonal residences for park personal, maintenance shops, and small campgrounds. The Discharger's report of waste discharge did not provide any information on the design capacity of each of these small systems.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Surface water drainage from the North Grove WWTF and five small onsite septic tank leachfield systems is to San Antonio Creek, a tributary to the South Fork of the Calaveras River, which flows into New Hogan Reservoir. Surface water drainage from the other three small septic tank leachfield systems is to the North Fork of the Stanislaus River, which flows to New Melones Reservoir. The *Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Fourth Edition* (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. Beneficial uses often determine the water quality objectives that apply to a water body. For example, waters designated as municipal and domestic supply must meet the maximum contaminant levels (MCLs) for drinking waters. The Basin Plan sets forth the applicable beneficial uses (industrial, agricultural, and domestic supply in this instance) of groundwater, procedure for application of water quality objectives, and the process for and factors to consider in allocating waste assimilation capacity.

Antidegradation

The antidegradation directives of Section 13000 of the California Water Code require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Waters can be of high quality for some constituents or beneficial uses and not others. Policies and procedures for complying with this directive are set forth in the Basin Plan (including by reference State Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," or "Antidegradation" Policy).

Resolution 68-16 is applied on a case-by-case, constituent-by-constituent basis in determining whether a certain degree of degradation can be justified. It is incumbent upon the Discharger to provide technical information for the Board to evaluate that fully characterizes:

- All waste constituents to be discharged;
- The background quality of the uppermost layer of the uppermost aquifer;
- The background quality of other waters that may be affected;
- The underlying hydrogeologic conditions;
- Waste treatment and control measures;
- How treatment and control measures are justified as best practicable treatment and control;
- The extent the discharge will impact the quality of each aquifer; and

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- The expected degradation to water quality objectives.

In allowing a discharge, the Board must comply with CWC section 13263 in setting appropriate conditions. The Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC 13263(b)) and must consider other waste discharges and factors that affect that capacity.

Certain waste constituents in municipal wastewater are not fully amenable to waste treatment and control and it is reasonable to expect some impact on groundwater. Some degradation for certain constituents is consistent with maximum benefit to the people of California because the technology, energy, water recycling, and waste management advantages of municipal utility service to the state far outweigh the environmental impact damage of a community that would otherwise be reliant on numerous concentrated individual wastewater systems. Economic prosperity of local communities is of maximum benefit to the people of California, and therefore sufficient reason to accommodate increases in wastewater discharge provided terms of reasonable degradation are defined and met. The proposed Order authorizes some degradation consistent with the maximum benefit to the people of the state, but does not authorize pollution.

Groundwater monitoring has never been conducted at the site and therefore, staff are unable to establish the most appropriate groundwater limits. In addition, certain aspects of waste treatment and control practices may not be justified as representative of best practicable treatment and control (BPTC). Reasonable time is necessary to gather specific information about the WWTF and the site to make informed, appropriate, long-term decisions. This proposed Order, therefore, establishes interim receiving water limitations to assure protection of the beneficial uses of groundwater of the State, pending the completion of certain tasks, and provides time schedules to complete specified tasks. The Discharger is expected to identify, implement, and adhere to, BPTC as individual practices are reviewed and upgraded in this process. During this period, degradation may occur from certain constituents, but can never exceed water quality objectives (or background water quality should it exceed objectives) or cause nuisance.

Water quality objectives define the least stringent limits that could apply as water quality limitations for groundwater at this location, except where background quality unaffected by the discharge already exceeds the objective. The values below reflect water quality objectives that must be met to maintain specific beneficial uses of groundwater. Unless natural background for a constituent proves higher, the groundwater quality limit established in proposed Order is the most stringent of the values listed for the listed constituents.

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<u>Constituent</u>	<u>Units</u>	<u>Value</u>	<u>Beneficial Use</u>	<u>Criteria or Justification</u>
Ammonia	mg/L	1.5	MUN ¹	Taste and Odor ²
Nitrate as N	mg/L	10	MUN ¹	Primary MCL ⁶
Nitrite as N	mg/L	1	MUN ¹	Primary MCL ⁶
Total Dissolved Solids	mg/L	450 ⁷	AGR ³	Protection of salt sensitive crops ⁴
		500	MUN ¹	Recommended Secondary MCL ⁵
		1,000	MUN ¹	Recommended Upper MCL ⁵
Total Coliform Organisms	MPN/100 ml	Less than 2.2	MUN ¹	Basin Plan
pH	pH Units	6.5 to 8.4	MUN ¹	Secondary MCL ⁴
Formaldehyde	mg/L	0.1	MUN ¹	Human Health ⁸
Zinc	mg/L	2.0	AGR ³	Recommended Secondary MCL ⁵
Phenol	mg/L	2.1	MUN ¹	Human Health ⁹

1 Municipal and domestic supply

2 J.E. Amoore and E. Hautala, *Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution*, Journal of Applied Toxicology, Vol. 3, No. 6 (1983).

3 Agricultural supply

4 Ayers, R. S. and D. W. Westcot, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985)

5 Title 22, California Code of Regulations (CCR), section 64449, Table 64449-B

6 Title 22, CCR, section 64431, Table 64431-A

7 Title 22, CCR, section 64439

8 DHS notification level based on toxicity

9 U.S. EPA IRIS reference dose

Domestic wastewater contains numerous dissolved inorganic waste constituents (i.e., salts, minerals) that together comprise total dissolved solids (TDS). Each component constituent is not individually critical to any beneficial use. Critical constituents are individually listed. The cumulative impact from these other constituents, along with the cumulative affect of the constituents that are individually listed can be effectively controlled using TDS as a generic indicator parameter.

Not all TDS constituents pass through the treatment process and soil profile in the same manner or rate. Chloride tends to pass through both rapidly to groundwater. As chloride concentrations in most groundwaters in the region are much lower than in treated municipal wastewater, chloride is a useful indicator parameter for evaluating the extent to which effluent reaches groundwater. Boron is another TDS constituent that may occur in wastewater in concentrations greater than groundwater depending on the source water and the extent residents use cleaning products containing boron. Other indicator constituents for monitoring for groundwater degradation due to recharged effluent include total coliform bacteria, ammonia and total nitrogen.

Treatment Technology and Control

Given the character of domestic wastewater and limitation on resources for a small discharge, the Regional Board can focus on the water quality objective for three main indicator parameters to regulate an acceptable degree of impact on water quality: TDS, total coliform, and nitrogen. Because RV waste is also accepted at this facility, the Regional Board must also focus on the main parameters in that waste stream (ammonia, zinc, phenols, and formaldehyde).

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Total coliform organisms, the indicator parameter for pathogenic organisms, should not be found in groundwater under a well-sited and designed subsurface disposal system. The applicable water quality objective and threshold of impact on beneficial use is less than 2.2. MPN/100 ml. To continue to discharge, the WWTF must consistently reduce coliform organisms to this level, which should be achievable at the design percolation rates despite the substandard separation from groundwater. If not met, the Discharger must investigate additional treatment, including but not limited to disinfection, to assure the water quality objective is met.

Domestic wastewater typically contains nitrogen, in several forms, in concentrations greater than water quality objectives. Nitrogen may be removed to some degree during the soil infiltration/treatment process, but the reduction may not be sufficient in this concentrated leachfield application to assure compliance with the governing water quality objective, the MCL for nitrate of 10 mg/L. If the MCL is exceeded, the Discharger must investigate additional treatment to assure the water quality objective is met. This may include, but not be limited to, nitrification and denitrification.

Waste constituents that are forms of salinity pass through the treatment process and soil profile and effective control of long-term affects relies upon effective source control. Long-term discharge of domestic wastewater with higher concentrations of TDS than groundwater will degrade that groundwater until the groundwater concentrations reflect the balance of wastewater input and groundwater recharge, particularly for the more conservative components of TDS (e.g., sodium and chloride). The quality of source water for the Big Trees State Park WWTFs is exceptional, with a TDS of 27 mg/L. Salt addition through use should be within the expected range, and therefore the TDS effluent limit has been set at 230 mg/L. For comparison, the national average increment for TDS ranges from 100 to 300 mg/L, according to *Wastewater Engineering* by Metcalf & Eddy; the incremental maximum in the Basin Plan for the Tulare Lake Basin is 500 umhos/cm (about 300 mg/L); and the incremental average standard allowed in the Santa Ana Basin is 230 mg/L. Exceeding the governing water quality objective, 450 mg/L based on sensitive crop protection from irrigation use of water, is not at risk. However, degradation to 450 mg/L cannot be considered reasonable, as practices that might increase effluent concentrations such as the use of self-regenerating water softeners cannot be considered necessary with this quality of water supply and the brines would endanger the effectiveness of the leachfields. The proposed Order contains an effluent limit and groundwater limit of 230 mg/L. The limit is more restrictive than the water quality objective, but has no economic impact on the Discharger as it should be no more stringent than existing water quality.

Other constituents in treated domestic waste that may pass through the treatment process and the soil profile include recalcitrant organic compounds (e.g., ethylene glycol, or antifreeze), and septic tank additives that park employees might use to decrease the need for tank cleanings. This Order requires regular user education to control these types of constituents, and expressly prohibits the discharge of hazardous waste or designated waste to the septic tanks. Therefore, such constituents are not expected to be present in the effluent discharged to the leachfields.

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This Order contains an effluent pH limitation, but as normal domestic waste falls within the prescribed range for groundwater quality, this effluent limitation should have no impact except to encourage user education about dumping acidic and basic chemicals into the sewerage system.

The leachfield design assumes sustained infiltration through the entire bottom and sidewall area of the disposal trenches, which is not uncommon but certainly not a conservative design. It is imperative that extraneous water sources be precluded from entering the effluent collection system and leachfield area. Pool drainage, inflow and infiltration, and rainfall run-on to the leachfield area should all be controlled to the extent feasible. The proposed Order focuses on user rules and education.

Title 27

Title 27, CCR, section 20005 et seq. ("Title 27"), contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for containment of classified waste, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent is acceptable pursuant to these regulations.

Discharges of domestic sewage and treated effluent can be treated and controlled to a degree that will not result in unreasonable degradation of groundwater. For this reason, treatment and storage facilities associated with municipal wastewater treatment plants have been conditionally exempted from Title 27, except for the discharge to land of residual sludge and solid waste generated as part of the treatment process [section 20090(a) of Title 27]. The condition requires that the discharge be regulated by waste discharge requirements (WDRs), or that WDRs have been waived, and that the discharge not result in violation of any water quality objective in groundwater.

Proposed Order Terms and Conditions**Discharge Prohibitions and Specifications**

The proposed Order establishes an average monthly dry weather flow limit of 3,000 gpd and 19,000 gpd for the existing leachfield and new leachfield, respectively, for the North Grove WWTF. After December 2006, discharge of effluent to the existing leachfield is allowed only on an emergency basis. The Discharger needs to continue to use the spray field until the new leachfield is constructed in 2006. However, this Order only allows the use of the spray field beyond 1 October 2006 if the Discharger submits, and the Executive Officer approves, a report certifying that a wastewater disinfection system has been constructed, is capable of meeting effluent limits prescribed by this Order, and is fully operational.

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Monitoring Requirements

Section 13267 of the CWC authorizes the Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. In recent years there has been increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment of administrative civil liability where appropriate.

The proposed Order includes monitoring requirements for septic tanks, septic tank effluent, leachfields, sprayfield, and groundwater.

The Title 27 zero leakage protection strategy relies heavily on extensive groundwater monitoring to increase a discharger's awareness of, and accountability for, compliance with the prescriptive and performance standards. With a high volume, concentrated, uncontained discharge to land, monitoring takes on even greater importance. The proposed Order includes monitoring of applied waste quality, application rates, and groundwater.

Title 27 regulations pertaining to groundwater monitoring and the detection and characterization of waste constituents in groundwater have been in effect and successfully implemented for many years. No regulation currently specifies similar criteria more suitable for a situation where extensive infiltration into groundwater occurs. However, where, as here, such infiltration occurs, it is appropriate that the Title 27 groundwater monitoring procedures be extended and applied on a case-by-case basis under Water Code section 13267.

The Discharger must monitor groundwater for constituents present in the discharge and capable of reaching groundwater and violating groundwater limitations if its treatment and control, and any dependency of the process on sustained environmental attenuation, proves inadequate.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. However, information is presently insufficient to develop final effluent and groundwater limitations, so the proposed Order contains interim limitations. Additional information must be developed and documented by the Discharger as required by schedules set forth in the proposed Order. As this additional information is obtained, decisions will be made concerning the best means of assuring the highest water quality possible and that could involve substantial cost. It may be appropriate to reopen the Order if applicable laws and regulations change, but the mere possibility that such laws and regulations may change is not sufficient basis for reopening the Order. The CWC requires that waste discharge requirements implement all applicable requirements.